



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Protective Equipment

Evaluation of PPE on Operator Movement and Performance (Survivability)

The Computer Assisted Rehabilitation Environment (CAREN), traditionally used for rehabilitation purposes, is being employed in a unique way at NHRC. Service Members are meeting opposing forces and hostile situations with greater loads as the emphasis on PPE continues to rise. These very same loads, when carried into battle, pose other risks of injury and performance deficits for US Marines and operators from other US military branches. The trade-off between surface-area protection by armor plates and the ability to move quickly and with agility translates directly to survivability. As a result, an inverse relationship is seen: As body armor increases adding more weight and gear, it is believed that mobility decreases, making it more difficult for the Service Member to maneuver efficiently and quickly, and vice versa. The Physiological and Cognitive Operational Research Environment team, within the Warfighter Performance Department at NHRC, is using the CAREN to measure survivability by comparing the effects of varying PPE on vision, range of motion, and performance on marksmanship tasks and other tasks relevant to the Service Member. Sponsored by the ONR and USSOCOM, equipment that is being tested ranges from that currently used by the different branches of the DoD, to novel designs that are being designed, including those from Product Manager Infantry Combat Equipment and the USSOCOM Tactical Assault Light Operator Suit program. This gear is being designed to reduce Service Member injury both acutely (e.g., blast injury, etc.) and long term (e.g., lower back pain). The balance between maneuverability and PPE is not only integral to the success and safety of the individual Service Member but also has bearing on the overall success of a mission. The goal of the gear being designed is to reduce Service Member injury both acutely and long term. The NHRC Physiological and Cognitive Operational Research Environment team is integral in the process of developing PPE that meets the many criteria required for both short- and long-term requirements.